10/053,344

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L1	5212448 5422576 4973906 5225780 4442404 5229717 5327088 5347216 5347218 5402067 5561370 6133735 6166543 4875012 5023551 5256967 5309101 5315249 5345176 5359289 5459401 5602476 6144201 6169398 6219571 6219571 5281916 5285158 5291891 5329231 5337000 5349295 5545992 5621321 RE35656 5704357 5910728 6023634 6097185 6204663 5202632 5239266 5270654 5280244 5309098 5498962 5541513 5668474 5798642 5825184	75	L1

END OF SEARCH HISTORY

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

7. Document ID: US 5229717 A EP 571212 A1 IL 105665 A

L7: Entry 7 of 7 File: DWPI Jul 20, 1993

DERWENT-ACC-NO: 1993-242606
DERWENT-WEEK: 199330

TITLE: Simultaneous two-contrast fast spin echo NMR imaging system - modifies FSE pulse sequence by producing readout gradient waveform that produces two gradient recalled NMR echo signals

INVENTOR: HINKS, R S

PRIORITY-DATA: 1992US-0887989 (May 22, 1992)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 5229717 A	July 20, 1993		012	G01R033/20
EP 571212 A1	November 24, 1993	E	013	G01R033/56
IL 105665 A	November 28, 1994		000	G01R033/20

INT-CL (IPC): G01R 33/20; G01R 33/56

ABSTRACTED-PUB-NO: US 5229717A
BASIC-ABSTRACT:

A fast spin-echo NMR pulse sequence is modified to produce a pair of gradient recalled echo signals between each successive pair of RF refocusing pulses. The first gradient recalled echo signal in each pair is acquired and employed to reconstruct a first image and the second gradient recalled echo signal in each pair is employed to reconstruct a second image.

The two gradient recalled echo signals in each pair are separately phase encoded such that the two reconstructed images having contrasting T2-weighting.

USE/ADVANTAGE - Nuclear magnetic resonance imaging allows simultaneous acquisition of multiple images of differing contrast using fast spin echo NMR scan.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

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Terms	Documents
L6 or l5	7

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Search Results - Record(s) 1 through 7 of 7 returned.

☐ 1. Document ID: US 6133735 A

L7: Entry 1 of 7 File: DWPI Oct 17, 2000

DERWENT-ACC-NO: 2001-030886
DERWENT-WEEK: 200242

TITLE: Nuclear magnetic resonance characteristics determination for boreholes, involves applying pulse sequence signals to pair of coils and detecting spin echoes at logging device

INVENTOR: HURLIMANN, M D; RYU, S ; SEN, P N ; SONG, Y

PRIORITY-DATA: 1998US-0198535 (November 24, 1998), 1997US-0936892 (September 25, 1997)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 6133735 A	October 17, 2000		018	G01V003/00

INT-CL (IPC): G01 V 3/00

ABSTRACTED-PUB-NO: US 6133735A
BASIC-ABSTRACT:

NOVELTY - Pule sequence signals are applied to a pair of coils on a logging device. The signals implement repeated refocusing of spins in formations surrounding an earth borehole by both adiabatic and non-adiabatic reorientation of spins to form spin echoes. The spin echoes indicating nuclear magnetic resonance characteristics of the formations are detected at a logging device.

DETAILED DESCRIPTION - A logging device, in which the axes of the coils are orthogonal, is arranged in the borehole. A pre-polarizing signal produced at the logging device is applied to a primary coil or a tertiary coil. The pulse sequence signals implement repeated refocusing of spins in the formations by both adiabatic and non-adiabatic reorientation of spins to form spin echoes. Spin echoes indicate the nuclear magnetic resonance characteristics of the earth formations and are detected at the tertiary coil of the logging device using the primary coil. Adiabatic reorientation is performed by varying simultaneously signals in the pair of coils. Sinusoidal signals are applied to the coils during adiabatic reorientations. The total adiabatic reorientation before and after each non-adiabatic reorientation is a rotation of 180 deg. +n360 deg. , where n = 0,1,2....... Alternatively the total adiabatic reorientation after each non-adiabatic reorientation is 180 deg. /n, where n = 0,1,2....... An earth's magnetic field introduces a spurious phase component to the spins during non-adiabatic reorientations. The adiabatic reorientations are operated to the spins over a range of angles such that the earth's magnetic field introduces a further phase component to the spins. The further phase component cancels the spurious phase component. The adiabatic reorientations preceding a pair of successive non-adiabatic reorientations are operated to rotate the spins to have the same polarity before each of pair of successive non-adiabatic reorientations. De-phasing due to the finite transition time of non-adiabatic reorientations in the earth's magnetic field is cancelled in the spin echo following another pair of non-adiabatic reorientations.

An INDEPENDENT CLAIM is also included for apparatus to determine nuclear magnetic resonance characteristic of formations surrounding borehole.

USE - For determining nuclear magnetic resonance characteristics of formations surrounding boreholes.

ADVANTAGE - The volume of investigation is large. The signal coming from different depths can be differentiated by its Larmor frequency. Pulse sequences do not suffer from the rapid de-phasing. The echo refocuses even in the presence of static background field, either uniform or non-uniform. Also the pulse sequence makes the echo formation immense to small DC offset in the driving circuitry.

DESCRIPTION OF DRAWING(S) - The figure shows the signals applied to coils to obtain pulse sequence.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

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2. Document ID: US 5422576 A

L7: Entry 2 of 7 File: DWPI Jun 6, 1995

DERWENT-ACC-NO: 1995-214772
DERWENT-WEEK: 199528

TITLE: Magnetic resonance angiography using fast spin echo sequence - uses first and second image data sets to form composite image data set which has increased contrast between blood vessel and other tissues

INVENTOR: KAO, Y; TURSKI, P A ; WINKLER, S S

PRIORITY-DATA: 1993US-0090725 (July 13, 1993)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 5422576 A	June 6, 1995		009	G01R033/20

INT-CL (IPC): G01 R 33/20

ABSTRACTED-PUB-NO: US 5422576A
BASIC-ABSTRACT:

The method involves performing a fast-spin-echo scan in which a first NMR data set S1 is acquired from NMR echo signals having a relatively short echo time TE1 and a second NMR data set S2 is acquired from NMR echo signals having a relatively long echo time TE2.

The method also entails calculating a composite NMR data set S, from corresp values in the first and second NMR data sets S1 and S2 in accordance with the expression Sc = sqrt(S1 sqrd +
USE/ADVANTAGE - For producing black blood magnetic resonance angiogram. Does not increase scanning time, while post-processing is relatively simple.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

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3. Document ID: WO 9508777 A1 AU 9477221 A

L7: Entry 3 of 7 File: DWPI Mar 30, 1995

DERWENT-ACC-NO: 1995-139705
DERWENT-WEEK: 199518

TITLE: Viscometer for on-line measurement of liquids or polymer melts - incorporates valved by-pass system directing samples into measurement chamber wherein NMP pulses are induced and echoes calibrated

INVENTOR: TANZER, C I

PRIORITY-DATA: 1993US-0125911 (September 23, 1993)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 9508777 A1	March 30, 1995	E	021	G01R033/44
AU 9477221 A	April 10, 1995		000	G01R033/44

INT-CL (IPC): G01 R 33/44

ABSTRACTED-PUB-NO: WO 9508777A
BASIC-ABSTRACT:

An on-line, liquid flow-through system for an industrial NMR system whereby a liquid (2) flowing through conduits (8) into a sample measurement chamber (4) disposed between the poles of a magnet (6). A temperature controlled air curtain maintains the sample in the chamber (4) at the same temperature as the flowing liquid (2). A valve (10) operating in conjunction with a control valve (12) serves to fill the chamber (4) with fresh fluid for each measurement sequence. An excitation NMR pulse sequence is generated and transferred into said sample, the spin-echo responses being received and T2 values calculated there-on. The viscosity of the sample is then determined by relating the T2 values to the calibration coefficients of known samples.

Also claimed is a means for calibrating products that require melting, whereby a vertically mounted single screw extruder (14), fitted with multi-stage heater units (18) and driven by a motor (16) melts samples introduced via a hopper (22) and forces the melt into the measurement chamber (20).

USE - For measuring the viscosity of liquids or polymer melts.

ADVANTAGE - May be used in an on-line facility for measuring a range of viscosity values without requiring re-calibration.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC
Draw Desc | Clip Img | Image

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4. Document ID: US 5345176 A

L7: Entry 4 of 7 File: DWPI Sep 6, 1994

DERWENT-ACC-NO: 1994-285640
DERWENT-WEEK: 199435

TITLE: Stabilised fast spin echo NMR pulse sequence with improved slice selection - reduces image artifacts in FSE pulse sequences by producing RF refocussing pulses which stabilise magnitude of acquired spin echo signals

INVENTOR: HINKS, R S; LEROUX, P L

PRIORITY-DATA: 1993US-0092172 (July 15, 1993), 1992US-0920952 (July 28, 1992)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 5345176 A	September 6, 1994		011	G01R033/48

INT-CL (IPC): G01R 33/48

ABSTRACTED-PUB-NO: US 5345176A
BASIC-ABSTRACT:

The NMR device comprises device for generating a polarizing magnetic field, excitation device for generating an RF excitation magnetic field which produces transverse magnetization in spins subjected to the polarizing magnetic field and receiver for sensing an NMR signal produced by the transverse magnetization and producing digitized samples of the NMR signal. A first gradient device generates a first magnetic field gradient to phase encode the NMR signal and a second gradient device generates a second magnetic field gradient to frequency encode the NMR signal. A pulse control device is coupled to the excitation device, first gradient device, second gradient device, and receiver device,

The pulse control device conducts a fast spin echo pulse sequence in which a series of NMR echo signals are produced in response to a corresponding series of RF refocusing pulses produced by the excitation device, and in which a set of NMR echo signals following the first NMR echo signal in the series of NMR echo signals are stabilized to have a similar amplitude (S) by altering the flip angle produced by RF refocusing pulses in the series, and the flip angle (theta) produced by the first RF refocusing pulse in the series is set to the same flip angle (theta) as that of the second RF refocusing pulse in the series.

USE/ADVANTAGE - To stabilise a series of NMR spin echo signals without exceeding the RF power capabilities of the system or sacrificing slice or slab selection capability.

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5. Document ID: US 5315249 A

L7: Entry 5 of 7 File: DWPI May 24, 1994

DERWENT-ACC-NO: 1994-166757
DERWENT-WEEK: 199420

TITLE: Nuclear magnetic resonance system for measurement of human tissue etc. - modifies amplitude of nutation angle produced in spins by corresponding RF re-focussing pulses to stabilise magnitude of early NMR echo signals during each slot

INVENTOR: HINKS, R S; LE ROUX, P L

PRIORITY-DATA: 1992US-0920952 (July 28, 1992)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 5315249 A	May 24, 1994		012	G01R033/20

INT-CL (IPC): G01R 33/20

ABSTRACTED-PUB-NO: US 5315249A
BASIC-ABSTRACT:

The NMR system generates a polarising magnetic field, and an

excitation device generates an RF excitation magnetic field which produces transverse magnetization in spins subjected to the polarizing magnetic field. A receiver senses an NMR signal produced by the transverse magnetization and produces digitised samples of the NMR signal. Gradient devices generate magnetic field gradients to phase encode and frequency encode the NMR signal.

- A pulse controller is coupled to the excitation device, the gradient devices, receiver, and conducts a fast spin echo pulse sequence in which a series of NMR echo signals are produced in response to a single RF excitation pulse followed by a corresponding series of RF refocusing pulses produced by the excitation device, and in which the NMR echo signals are stabilised to a smoothly decaying amplitude by altering the flip angle produced by one or more of the initial RF refocusing pulses in the series.

ADVANTAGE - Reduced image artifacts

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC
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6. Document ID: US 5281916 A

L7: Entry 6 of 7 File: DWPI Jan 25, 1994

DERWENT-ACC-NO: 1994-042954
DERWENT-WEEK: 199405

TITLE: NMR angiography using fast spin echo pulse sequences - using magnetic field gradient to impart net moment to NMR each echo signal to sensitise each NMR echo signal to motion along direction of gradient, zeroing first moment at each RF re-focusing pulse

INVENTOR: BERNSTEIN, M A; HINKS, R S

PRIORITY-DATA: 1992US-0921532 (July 29, 1992)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 5281916 A	January 25, 1994		012	G01R033/20

INT-CL (IPC): G01R 33/20

ABSTRACTED-PUB-NO: US 5281916A
BASIC-ABSTRACT:

An NMR angiogram is produced from two data sets acquired using a fast pulse sequence. One data set is acquired with a readout gradient having a first moment of zero at each refocusing pulse and a first value at each acquired echo signal. A second data set is acquired with a readout gradient having a first moment of zero at each refocusing pulse and a second value at each acquired echo signal.

Signals from stationary tissues are suppressed with a dephasing gradient pulse in the slice select direction applied after each refocusing pulse, and a corresponding rewinder gradient pulse is applied after each acquired echo signal. Signal cancellation is avoided by separately dealing with the phase of each component of the NMR echo signals in the FSE pulse sequence. This is accomplished by nulling the first gradient moment at each RF refocusing pulse while providing desired first gradient moment at each NMR echo signal.

USE/ADVANTAGE - For producing an angiogram using FSE pulse sequence. It is possible to apply method to all three magnetic field gradients used in FSE pulse sequence. Using any of pulse sequences an angiogram can be reconstructed using phase information from a single NMR data set. Dynamic range of scan

can be increased and sensitivity increased to signals produced by smaller structures like blood vessels and enhanced contrast in image by adding a dephasing gradient pulse.

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Search Results - Record(s) 1 through 4 of 4 returned.

☐ 1. Document ID: GB 2330203 A NO 9804456 A CA 2246180 A1 GB 2330203 B US 6166543 A CA 2246180 C

L14: Entry 1 of 4 File: DWPI Apr 14, 1999

DERWENT-ACC-NO: 1999-193209
DERWENT-WEEK: 200242

TITLE: Magnetic resonance borehole logging using gradient echoes

INVENTOR: SEN, P N; SEZGINER, A ; SUN, B ; TAHERIAN, R ; TAHERIAN, M R

PRIORITY-DATA: 1997US-0936892 (September 25, 1997)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
GB 2330203 A	April 14, 1999		032	G01V003/32
NO 9804456 A	March 26, 1999		000	
CA 2246180 A1	March 25, 1999	E	000	
GB 2330203 B	December 15, 1999		000	
US 6166543 A	December 26, 2000		000	G01V003/00
CA 2246180 C	July 24, 2001	E	000	G01V003/32

INT-CL (IPC): G01 V 3/00; G01 V 3/32

ABSTRACTED-PUB-NO: GB 2330203A
BASIC-ABSTRACT:

NOVELTY - The method comprises:

(1) applying a magnetic field Ba in a volume of the formation to polarize the nuclei of hydrogenous connate fluids within the formation.

(2) applying a magnetic field Bbin the volume formation such that the two fields, Ba and Bb are orthogonal to one another and a change in the polarity of field Bb reverses the direction of precession thus generating a gradient echo.

(3) detecting a signal induced in the formation after the nuclei start to precess in the plane perpendicular to Bb where the precession frequency is proportional to the strength of the magnetic field Bb.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM describes an apparatus for performing the above method.

Another independent claim describes a method for measuring the longitudinal relaxation time and spin-spin relaxation time of an earth formation by;

(a) generating a first gradient echo train during a magnetization preparation period.

(b) generating a second magnetization train.

(c) extracting the longitudinal relaxation time from the first gradient echo train and the spin-spin relaxation time from the second echo train.

USE - Surveying earth formations surrounding a bore hole using information gained from nuclear magnetic resonance (claimed).

ADVANTAGE - The technique avoids the need to generate an initial radio frequency (RF) pulse to generate the spin echoes which fixes the precession frequency and constrains the lateral measurement to a thin shell region around the borehole.
ABSTRACTED-PUB-NO:

GB 2330203B EQUIVALENT-ABSTRACTS:

NOVELTY - The method comprises:

(1) applying a magnetic field Ba in a volume of the formation to polarize the nuclei of hydrogenous connate fluids within the formation.

(2) applying a magnetic field Bbin the volume formation such that the two fields, Ba and Bb are orthogonal to one another and a change in the polarity of field Bb reverses the direction of precession thus generating a gradient echo.

(3) detecting a signal induced in the formation after the nuclei start to precess in the plane perpendicular to Bb where the precession frequency is proportional to the strength of the magnetic field Bb.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM describes an apparatus for performing the above method.

Another independent claim describes a method for measuring the longitudinal relaxation time and spin-spin relaxation time of an earth formation by;

(a) generating a first gradient echo train during a magnetization preparation period.

(b) generating a second magnetization train.

(c) extracting the longitudinal relaxation time from the first gradient echo train and the spin-spin relaxation time from the second echo train.

USE - Surveying earth formations surrounding a bore hole using information gained from nuclear magnetic resonance (claimed).

ADVANTAGE - The technique avoids the need to generate an initial radio frequency (RF) pulse to generate the spin echoes which fixes the precession frequency and constrains the lateral measurement to a thin shell region around the borehole.

US 6166543A

NOVELTY - The method comprises:

(1) applying a magnetic field Ba in a volume of the formation to polarize the nuclei of hydrogenous connate fluids within the formation.

(2) applying a magnetic field Bbin the volume formation such that the two fields, Ba and Bb are orthogonal to one another and a change in the polarity of field Bb reverses the direction of precession thus generating a gradient echo.

(3) detecting a signal induced in the formation after the nuclei start to precess in the plane perpendicular to Bb where the precession frequency is proportional to the strength of the magnetic field Bb.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM describes an apparatus for performing the above method.

Another independent claim describes a method for measuring the longitudinal relaxation time and spin-spin relaxation time of an earth formation by;

(a) generating a first gradient echo train during a magnetization preparation period.

(b) generating a second magnetization train.

(c) extracting the longitudinal relaxation time from the first gradient echo train

and the spin-spin relaxation time from the second echo train.

USE - Surveying earth formations surrounding a bore hole using information gained from nuclear magnetic resonance (claimed).

ADVANTAGE - The technique avoids the need to generate an initial radio frequency (RF) pulse to generate the spin echoes which fixes the precession frequency and constrains the lateral measurement to a thin shell region around the borehole.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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2. Document ID: CN 1118879 A EP 675372 A1 JP 07265281 A US 5521505 A

L14: Entry 2 of 4 File: DWPI Mar 20, 1996

DERWENT-ACC-NO: 1995-338410
DERWENT-WEEK: 199743

TITLE: High speed MR imaging appts. based on GRASE - has MR appts. with RF emitter controlling timing of refocussing RF pulses and gradient phase encoding pulse generator generating reversed polarity signals with strength equal to integrated phase encode amount

INVENTOR: KAWANO, O; KOHNO, S

PRIORITY-DATA: 1994JP-0087715 (March 31, 1994)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
CN 1118879 A	March 20, 1996		000	G01R033/48
EP 675372 A1	October 4, 1995	E	022	G01R033/561
JP 07265281 A	October 17, 1995		008	A61B005/055
US 5521505 A	May 28, 1996		019	G01V003/00

INT-CL (IPC): A61 B 5/055; G01 N 33/48; G01 R 33/48; G01 R 33/561; G01 V 3/00

ABSTRACTED-PUB-NO: EP 675372A
BASIC-ABSTRACT:

The appts. includes a main magnet (1) and a sequencer (23) with a phase encoding gradient waveform generator (5) for three gradient field coils (2). An RF signal generator (7) with respective RF coil (3) is also provided. Reading and phase-encoding pulse generators are also provided along with a data processor.

The RF emitter controls timing and emission of an nth refocus RF pulse to establish (2(n-1) + 1)tau, emission of the excited pulse being regarded as a time origin and tau as a point of time when initial refocus pulses is emitted. The sequencer with the phase-encoding pulse generator generates a rewinding pulse of reversed polarity and having a strength corresponding to preceeding phase encode amount. The rewinding pulse is generated after a final spin echo is generated within each measuring period. The data processor records the data from the spin echo signals to produce a sectional image.

ADVANTAGE - Diminishes differences in signal strength between data adjacent to each other to suppress blurring artifacts.
ABSTRACTED-PUB-NO:

US 5521505A EQUIVALENT-ABSTRACTS:

An MR imaging apparatus using NMR phenomenon, comprising:

a main magnet for generating a uniform static magnetic field in an imaging space;

a first, a second and a third gradient field coils for generating three types of gradient field pulses, said three types of gradient field pulses comprising, slice-selecting gradient field pulses, reading gradient field pulses, and phase-encoding gradient field pulses, with magnetic strengths varying in three orthogonal directions in said imaging space;

an RF coil for emitting an excitation RF pulse and a plurality of refocus RF pulses and detecting echo signals;

RF emitting means for successively emitting said excitation RF pulse and said refocus RF pulses with predetermined timing through said RF coil;

slice-selecting gradient field pulse generating means for generating said slice-selecting gradient field pulses through said first gradient field coil for selecting slice planes, in timed relationship with said excitation RF pulse and said refocus RF pulses;

reading gradient field pulse generating means for generating, during each of periods between said refocus RF pulses, a plurality of gradient echo signals distributed across one of spin echo signals by switching polarity a plurality of times, and for generating said reading gradient field pulses through said second gradient field coil in timed relationship with said spin echo signals and said gradient echo signals;

phase-encoding gradient field pulse generating means for generating said phase-encoding gradient field pulses through said third gradient field coil immediately before generation of said echo signals, said phase-encoding gradient field pulses satisfying the following conditions:

(a) that said phase-encoding gradient field pulses have varied strengths to vary integrated phase encode amounts of said echo signals form a positive or negative value through zero to a negative or positive value according to an order of generation of said spin echo signals; and

(b) that said phase-encoding gradient field pulses have varied strengths to vary integrated phase encode amounts of each group of those of said gradient echo signals having the same place in an order of generation thereof within said periods, in a direction reverse to a direction in which integrated phase encode amounts of said spin echo signals vary, and to give said integrated phase encode amounts of each group of said gradient echo signals greater absolute values than said integrated phase encode amounts of said spin echo signals; and

data processing means for collecting data from said echo signals detected by said RF coil, and reconstructing a sectional image by arranging said data in a K space according to an integrated phase encode amount of each of said echo signal.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Clip Img | Image

3. Document ID: EP 567194 A2 EP 567194 A3 US 5347218 A

L14: Entry 3 of 4 File: DWPI Oct 27, 1993

DERWENT-ACC-NO: 1993-338247
DERWENT-WEEK: 199343

TITLE: Magnetic resonance imaging of body in magnetic field - applying RF pulse to excite portion of body with gradient magnetic field for encoding and second RF pulse at predetermined time after first pulse for detection of repetition time

INVENTOR: VAN YPEREN, G H

PRIORITY-DATA: 1992EP-0201156 (April 24, 1992)

- PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 567194 A2	October 27, 1993	E	009	G01R033/56
EP 567194 A3	May 18, 1994		000	G01R033/56
US 5347218 A	September 13, 1994		008	G01R033/20

INT-CL (IPC): G01R 33/20; G01R 33/56

ABSTRACTED-PUB-NO: EP 567194A
BASIC-ABSTRACT:

The method involves applying a first radio frequency pulse (31) for excitation of at least a portion of the body and then application of at least a first gradient magnetic field (G) for phase encoding of the excited portion. A second radio frequency pulse (32) is applied at a predetermined time after the first pulse, and a magnetic resonance spin echo signal is detected around a time, double the first, after the first radio frequency signal.

The repetition time between the first pulses in subsequent sequences in shorter than a transversal relaxation time of a relevant substance of the body. A third field is applied during detection for extending.

ADVANTAGE - Reduces acquisition time.
ABSTRACTED-PUB-NO:

US 5347218A EQUIVALENT-ABSTRACTS:

A phase encoding gradient magnetic field (39) is applied after the 180deg. rephasing pulse (321) in spin-echo magnetic resonance sequence. After detection of the spin-echo signal (33) the position dependent phases are compensated for by applying a further gradient magnetic field (39'), identical in size but opposite in sign. The phase difference (phi32,1-phi31,1) between the RF-pulses (311,321) applied within a sequence is constant over the sequences. With no position dependent effects left at the end of a sequence the next sequence can be started immediately following the earlier one.

A repetition time TR substantially shorter than the spin-spin relaxation time T2 is feasible, thereby developing a steady state of the magnetisatio n. A TR of 50 ms or less can be obtained, as well as strong signals for long T2 substances and good T2 contrast. RF spoiling by changing phases of RF-pulses in subsequent sequences can destroy the T2 signal and provide images with pure T1 contrast.

USE/ADVANTAGE - MR imaging with acquisition time considerably shorter than ever before.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC
Draw Desc | Clip Img | Image

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4. Document ID: DE 69311175 E EP 561628 A1 US 5280244 A EP 561628 B1

L14: Entry 4 of 4 File: DWPI Jul 10, 1997

DERWENT-ACC-NO: 1993-296895
DERWENT-WEEK: 199733

TITLE: Gradient moment nulling for fast spin NMR sequence - suppressing first moment of gradients at each RF refocusing pulse in sequence, and nulling first moments at each acquired NMR echo signal

INVENTOR: HINKS, R S

PRIORITY-DATA: 1992US-0854515 (March 19, 1992)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 69311175 E	July 10, 1997		000	G01R033/56
EP 561628 A1	September 22, 1993	E	013	G01R033/56
US 5280244 A	January 18, 1994		012	G01R033/20
EP 561628 B1	June 4, 1997	E	015	G01R033/56

INT-CL (IPC): G01R 33/20; G01R 33/56

ABSTRACTED-PUB-NO: EP 561628A
BASIC-ABSTRACT:

The method of suppressing image artifacts in an NMR system involves using a CPMG NMR pulse sequence to derive images. 90 deg. RF excitation pulses are generated in the presence of gradient pulse to give transverse magnetisation in a slice and re-enforced by 180 deg. RF refocusing pulses. The 180 deg. pulses occur every 14 milliseconds and 7 milliseconds after the 90 deg. pulse. The spin echoes are separately phase encoded by pulses of different magnitudes.

The gradient pulses (350-352) have a symmetrical form of -1,+2,-1 and are applied at each echo signal to null the first moment of the readout gradient at the centre of the refocusing pulses.

ADVANTAGE - Reduces motion artifacts in reconstructed images allowing faster image acquisition times.
ABSTRACTED-PUB-NO:

EP 561628B EQUIVALENT-ABSTRACTS:

A method of suppressing image artifacts caused by flowing nuclear spins which produce phase errors in the NMR echo signals acquired during a CPMG pulse sequence, the method comprising: (a) producing transverse magnetization in a region of interest by applying an RF excitation field pulse to the nuclear spins in the region of interest in the presence of a first magnetic field gradient and a polarizing magnetic field; (b) refocusing the transverse magnetization by applying a series of RF refocusing field pulses to the nuclear spins in the region of interest to produce a corresponding series of NMR echo signals; (c) phase encoding each NMR echo signal by applying a second magnetic field gradient to the nuclear spins in the region of interest during the interval after each RF refocusing field pulse and prior to its corresponding NMR echo signal; (d) acquiring each NMR echo signal in the presence of a third magnetic field gradient; and (e) modifying at least one of said first, second and third magnetic field gradients such that the first moment of said magnetic field gradient is substantially zero at the centre of each of said RF refocusing field pulses.

US 5280244A

The method involves producing transverse magnetization in a region of interest by applying an RF excitation field pulse to the nuclear spins in the region of interest in the presence of a first magnetic field gradient and a polarizing magnetic field.

The transverse magnetization is refocussed by applying a series of RF refocusing field pulses to the nuclear spins in the region of interest to produce a corresponding series of NMR echo signals.

Each NMR echo signal is phase encoded by applying a second magnetic field gradient to the nuclear spins in the region of interest during the interval after each RF refocusing field pulse and prior to its corresponding NMR echo signal.

Each NMR echo signal is acquired in the presence of a third magnetic field gradient. At least one of the three magnetic field gradients is modified such that the first moment of said magnetic field gradient is substantially zero at the centre of each of said RF refocusing field pulses.

ADVANTAGE - Improves CPMG NMR pulse sequence in reconstructed image.

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20nov02 12:37:53 User259284 Session D2019.1

SYSTEM:OS - DIALOG OneSearch
  File 155:MEDLINE(R) 1966-2002/Nov W3
*File 155: For updating information please see Help News155. Alert
feature enhanced with customized scheduling. See HELP ALERT.
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removal, customized scheduling. See HELP ALERT.
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  File  73:EMBASE 1974-2002/Nov W2
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*File  73: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
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         (c)2002 Japan Science and Tech Corp(JST)
  File  35:Dissertation Abs Online 1861-2002/Oct
         (c) 2002 ProQuest Info&Learning
  File 144:Pascal 1973-2002/Nov W3
         (c) 2002 INIST/CNRS
  File 105:AESIS 1851-2001/Jul
         (c) 2001 Australian Mineral Foundation Inc
*File 105: This file is closed (no updates)
  File  99:Wilson Appl. Sci & Tech Abs 1983-2002/Oct
         (c) 2002 The HW Wilson Co.
  File  58:GEOARCHIVE 1974-2002/NOV
         (c) 2002 Geosystems
*File  58: UD=200211 includes updates for July-November.
  File  34:SciSearch(R) Cited Ref Sci 1990-2002/Nov W4
         (c) 2002 Inst for Sci Info
*File  34: Alert feature enhanced for multiple files, duplicates
removal, customized scheduling. See HELP ALERT.
  File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
         (c) 1998 Inst for Sci Info
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         (c) 2002 Elsevier Science Ltd.
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  File  65:Inside Conferences 1993-2002/Nov W3
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  File 350:Derwent WPIX 1963-2002/UD,UM &UP=200274
         (c) 2002 Thomson Derwent
*File 350: Alerts can now have images sent via all delivery methods.
See HELP ALERT and HELP PRINT for more info.
  File 347:JAPIO Oct 1976-2002/Jul(Updated 021104)
         (c) 2002 JPO & JAPIO
*File 347: JAPIO data problems with year 2000 records are now fixed.
Alerts have been run. See HELP NEWS 347 for details.


Set     Items   Description
S1       5405   GRADIENT? ? AND MAGNETIC AND FIELD? ?(4N)(UNIFORM? OR HOMO-
                GEN? OR CONSTANT?? OR STATIC??)
```

S2	1331411	PERPENDICUL? OR TRANSVERS????? OR ORTHOGON???????????
S3	1313940	RF OR R()F OR HF OR H()F OR RADIOFREQUENC????? OR RADIO
S4	50827	(NMR OR MR OR RESONANCE OR MRI)(4N)SIGNAL? ?
S5	34669	PHAS????(2N)ANGL???
S6	6124	S4 AND PHAS????
S7	3631	MULTIECHO? OR (MULTIPLE OR MULTI)(1W)ECHO???
S8	59234	(POLARIS? OR POLARIZ?)(4N)(MAGNETIC OR FIELD? ?)
S9	484121	MAGNETIS? OR MAGNETIZ?
S10	22102	PRECESSION??
S11	7489	FSE OR FAST()SPIN???
S12	1811	DRIV???(2N)EQUILIBRI?????
S13	22	1AND11
S14	241	2AND11
S15	328	3AND11
S16	471	4AND11
S17	471	4AND11
S18	107	6AND11
S19	93	7AND11
S20	9	8AND11
S21	377	9AND11
S22	44	10AND11
S23	6	1AND12
S24	73	2AND12
S25	65	3AND12
S26	7	4AND12
S27	7	4AND12
S28	1	6AND12
S29	1	7AND12
S30	7	8AND12
S31	92	9AND12
S32	2	10AND12
S33	24	S13:S22 AND (DRIV??? OR EQUILIBRI????)
S34	216	S23:S32
S35	19	S34 AND SPIN()ECHO???
S36	21	14AND17
S37	15	14AND18
S38	32	14AND21
S39	1	14AND22
S40	2	24AND25
S41	12	24AND31
S42	14	25AND31
S43	31	14AND15
S44	21	14AND16
S45	15	36AND37
S46	10	36AND38
S47	9	37AND38
S48	12	43AND44
S49	12	43AND36
S50	11	43AND37
S51	17	43AND38
S52	21	44AND36
S53	15	44AND37
S54	10	44AND38
S55	118	S13 OR S20 OR S23 OR S26:S30 OR S32:S33 OR S35 OR S37 OR S-39:S54 OR S36
S56	85	RD S55 (unique items)
S57	61	S56 AND (MRI OR IMAG???)
S58	36	S57 AND FIELD? ?
S59	23	3AND58
S60	34	3AND57
S61	11	S60 NOT S59
S62	11	RD S61 (unique items)

59/9/21 (Item 14 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004687540
WPI Acc No: 1986-190882/198630
XRPX Acc No: N86-142653

NMR residual **magnetisation** cancellation method - applies reverse **gradient** pulse to phase encoding **field** such that algebraic sum is zero

Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: GLOVER G H; PELC N J

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 188006	A	19860723	EP 85116665	A	19851231	198630	B
FI 8504524	A	19860708				198643	
US 4665365	A	19870512	US 85689428	A	19850107	198721	
EP 188006	B	19900228				199009	
DE 3576209	G	19900405				199015	

Priority Applications (No Type Date): US 85689428 A 19850107

Abstract (Basic): EP 188006 B

In a nuclear **magnetic** resonance system, the (Gy) spatial phase-encoding **gradient** pulse is applied in internal (4). Since delaying the application of the phase-encoding pulse may increase the min. echo delay. However the rephasing (Gy) reverse **gradient** pulse in interval (6) is highly effective in reversing the residual **magnetization** effects due to the earlier (Gy) pulse. The encoding **gradient** pulse (Gy) is applied following the 180 degree **RF** pulse to avoid the associated imperfections.

USE - With **magnetic field gradient** pulses used to encode spatial information. (25pp Dwg.No.1/8)

Abstract (Equivalent): EP 188006 B

A method for undoing the effect of **magnetic field gradients** on the residual **transverse magnetisation** in a pulse sequence useful for producing **images** of a study object positioned in a **homogenous** magnet **field**, which pulse sequence includes a prdeetermined plurality of sequentially implemented views, each of said views including at least on **RF** excitation pulse for exciting nuclear spins in the object, one 180 deg. **RF** pulse for generating a **spin-echo** signal, and at least one encoding **magnetic field gradient** pulse used to encode spatial information into said **spin-echo** signal, characterised by applying said encoding **magnetic field gradient** pulse subsequent to the irradiation of the study object with said 180 deg. **RF** pulse, but prior to the occurrence of said **spin-echo** signal, said encoding **magnetic field gradient** pulse being applied along at least on directional axis of the study object; and applying, following the occurrence of said **spin-echo** signal, a reversing **magnetic field gradient** pulse so as to undo the effects of the encoding **magnetic field gradient** pulse on any residual **transverse magnetisation**, the amplitude of said reversing and encoding **gradient** pulses being selected such that the algebraic sum thereof along said one axis is equal to constant. (-pp)

Abstract (Equivalent): US 4665365 A

The method employs a reversing **gradient** pulse applied in the same direction as the encoding **gradient** pulse following the observation of the **spin-echo** signal. The encoding **gradient** pulse is applied following the 180 deg. **RF** pulse. The amplitudes of the encoding and reversing **gradient** pulses may be selected to be approx. the negatives of each other so as to substantially cancel the residual **magnetization**.

The amplitude of the reversing **gradient** pulse may, alternatively be selected such that the algebraic sum with the corresp. amplitude of the encoding **gradient** pulse is a constant. In this case, the residual **magnetization** is not necessarily cancelled, but rather is left in the same state after each view of the pulse sequence.

USE - Applicable to **multiple-echo** and **driven equilibrium** pulse sequences. (11pp)e

Title Terms: NMR; RESIDUE; **MAGNETISE**; CANCEL; METHOD; APPLY; REVERSE;

59/9/22 (Item 15 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004106350
WPI Acc No: 1984-251891/198441
XRPX Acc No: N84-188147
Cross-sectional planar **image** producing method using NMR - taking sequence of projections, each with different **transverse gradient** structure, to form cross-sectional **image**
Patent Assignee: MACOVSKI A (MACO-I)
Inventor: MACOVSKI A
Number of Countries: 012 Number of Patents: 009
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 121312	A	19841010	EP 84301061	A	19840217	198441	B
FI 8400613	A	19840819				198450	
US 4579121	A	19860401				198616	
IL 70977	A	19881130				198910	
EP 121312	B	19900822				199034	
DE 3483014	G	19900927				199040	
KR 9007540	B	19901015				199202	
EP 366158	B1	19920624	EP 89121492	A	19840217	199226	
DE 3485791	G	19920730	DE 3485791	A	19840217	199232	
			EP 89121492	A	19840217		

Priority Applications (No Type Date): US 83467661 A 19830218
Abstract (Basic): EP 121312 A

A principal axis **magnetic field** 'z' is produced in poles (13,14) using coils (16,17). Specific regions in the volume of interest (10) are selected using second coils (18,19) forming a **gradient field** in the 'z' direction. Similarly coils (23 and 24) on opposite sides of the object (10) form a **gradient field** in the 'x' direction, whilst other coils (20,25) form the 'y' **gradient field**. The first coils (16,17) create a **uniform field**, the **gradient** coils buck each other to produce varying **fields**.

R.F. coils (21,22) serve to excite **magnetic** spins in the object when in transmission mode, and when switched to reception mode receive the signals from the **magnetic** spin, for application to a signal processor (29). Between each sequential excitation the spins in the cross section are **driven** back into **equilibrium**
.

USE - For **imaging** various relaxation times.

1/8

DE 3485791 G

A principal axis **magnetic field** 'z' is produced in poles (13,14) using coils (16,17). Specific regions in the volume of interest (10) are selected using second coils (18,19) forming a **gradient field** in the 'z' direction. Similarly coils (23 and 24) on opposite sides of the object (10) form a **gradient field** in the 'x' direction, whilst other coils (20,25) form the 'y' **gradient field**. The first coils (16,17) create a **uniform field**, the **gradient** coils buck each other to produce varying **fields**. R. coils (21,22) serve to excite **magnetic** spins in the object when in transmission mode, and when switched to reception mode receive the signals from the **magnetic** spin, for application to a signal processor (29). Between each sequential excitation the spins in the cross section are **driven** back into **equilibrium**. USE - For **imaging** various relaxation times.

Abstract (Equivalent): EP 366158 B

Method for producing an **image** sensitive to the NMR relaxation time of a region comprising the steps of: acquiring a sequence of projection measurement signals of the region during a single relaxation period; processing the projection measurement signals such that they substantially represent the projection measurement that would have occurred at a specific time; and reconstructing the processed projection measurement signals into an **image** sensitive to the relaxation time of the region.

(Dwg.1/8)
EP 121312 B
Appts. for producing a cross sectional **image** of a plane in an object (10) comprising: means for providing a sequence of **rf** excitations (40,43) each involving a different **magnetic gradient** (48,51;50,53) to provide an array of received signals; means for processing the received signals (29) to form an array of projection signals; means for driving the **magnetisation** in the plane resulting from the **rf** excitations (40,43) back to equilibrium between **rf** excitation, the sequence of **rf** excitations (40,43) occurring during a relaxation period of the nuclei in the region; means of processing the array of projection signals so that they substantially represent signals that would occur at a specific time; and means for reconstructing the **image** of the object (10) using the array of projection signals.
(21pp

Abstract (Equivalent): US 4579121 A

An array of parallel planes of the object is excited, and signals from the nuclear spins in each of the planes are received using a **gradient field** normal to the planes. The received signals are processed to produce planar integral signals and the **magnetisation** in the volume is **driven** to **equilibrium**.

The sequence is repeated using arrays of parallel planes at different angles with associated **gradient fields** normal to the planes. The sequence of excitations occurring during a relaxation period of the nuclei in the object is also repeated and the array of planar integral signals are processed so that they represent the signals that would occur at a specific time. The three-dimensional **image** information is reconstructed using the planar integral signals from all of the arrays of parallel planes. (19pp)

Title Terms: CROSS; SECTION; PLANE; **IMAGE**; PRODUCE; METHOD; NMR;

59/9/20 (Item 13 from file: 350)
DIALOG(R)File 350:Derwent WPIX

007064920
WPI Acc No: 1987-064917/198709
XRPX Acc No: N87-049131
Producing **image** by NMR technique - using different time intervals between application of **radio** frequency pulses so as to cancel out any static nuclei
Patent Assignee: BRIGHAM & WOMENS (BRIG-N)
Inventor: HAWKES R C; PATZ H S
Number of Countries: 013 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 8701208	A	19870226	WO 86US1693	A	19860813	198709	B
AU 8662228	A	19870310				198721	
EP 232387	A	19870819	EP 86905128	A	19860813	198733	

Priority Applications (No Type Date): US 85765528 A 19850814
Abstract (Basic): WO 8701208 A

A sequence of **radio** frequency pulses are applied to nuclei in a magnetic **field** having an adequate gradient, so that a spatial periodicity in the **magnetisation** of the nuclei is established. The nuclei reach a state of **driven equilibrium** by application of **radio** frequency pulses to the sample.

Two **images** are generated, using different time intervals between the application of the **radio** frequency pulses. One **image** is subtracted from the other, cancelling out any static nuclei in the signal and relatively fast flowing nuclei never reach equilibrium state. This obtains a difference **image** in which the **image** elements are each determined solely by the nuclear magnetic resonance of nuclei in slowly flowing fluids in the sample.

ADVANTAGE - Can measure very slow blood flow in capillaries

Title Terms: PRODUCE; **IMAGE**; NMR; TECHNIQUE; TIME; INTERVAL; APPLY; **RADIO**; FREQUENCY; PULSE; SO; CANCEL; STATIC; NUCLEUS
Derwent Class: S03; S05
International Patent Class (Additional): G01R-033/20
File Segment: EPI
Manual Codes (EPI/S-X): S03-E07; S05-D02X

59/9/19 (Item 12 from file: 350)
DIALOG(R)File 350:Derwent WPIX

007726928 **Image available**
WPI Acc No: 1988-360860/198850
XRPX Acc No: N88-273295
Measurement of capillary blood flow using nuclear magnetic resonance - applying **RF** pulses to nuclear in magnetic **field** having large gradient, and obtaining two **images** with different spatial periodicity
Patent Assignee: BRIGHAM WOMEN HOSP (BRIG-N)
Inventor: HAWKES R C; PATZ H S
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4788500	A	19881129	US 87103467	A	19871001	198850	B

Priority Applications (No Type Date): US 87103467 A 19871001; US 85765528 A 19850814
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 4788500	A		14		

Abstract (Basic): US 4788500 A

Very slow flow rates are measured by steady state free **precession**, in which a sequence of **radio** frequency pulses are applied to nuclei in a magnetic **field** having a substantial gradient. A **driven equilibrium** state is obtained and, there is a spatial periodicity in the **magnetisation** response of the nuclei. Two **images** are generated.

The spatial periodicity, and the NMR response of flowing nuclei to the spatial periodicity, is different during the two **image** formations. One **image** is subtracted from the other, which cancels signals from static nuclei in the signal. The subtraction difference is proportional only to nuclei which are part of relatively slowly flowing liquids.

ADVANTAGE - Accurate **imaging** of low flow rates. Full information content is retrieved from relaxation signal.

1/6

59/9/18 (Item 11 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009264343 **Image available**
WPI Acc No: 1992-391754/199248
XRPX Acc No: N92-298818
NMR system for acquiring multiple **images** in **fast spin** echo scans - stores low-order **phase** encoding views in separate arrays but high-order views in all data arrays
Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: HINKS R S
Number of Countries: 004 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 515197	A1	19921125	EP 92304638	A	19920521	199248	B
US 5168226	A	19921201	US 91703990	A	19910522	199251	

Priority Applications (No Type Date): US 91703990 A 19910522
Cited Patents: 2.Jnl.Ref; EP 296834; EP 318212; EP 344518; US 4709212; US 4734646
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 515197	A1	E	12	G01R-033/56	
Designated States (Regional): DE GB NL					
US 5168226	A		11	G01R-033/20	

Abstract (Basic): EP 515197 A
The appts. includes a transceiver for producing an **RF** excitation **field**, and for sensing the induced **NMR** **signal** from the **transverse magnetisation** generated by the magnetic **field** assembly. A pulse controlled utilises a signal to generate digital waveforms which control gradient coil excitation to enable **phase** encoding of **NMR signals**.

In operation, the **fast spin** echo NMR pulse sequence acquires sixteen **NMR** echo **signals** of which four are shown (301-304). These signals are produced by a 90 deg. **RF** excitation pulse (305) in the presence of a gradient pulse (306). The **transverse magnetisation** is refocussed by each selective 180 deg. **RF** echo pulse (307), to produce spin echo signals that are separately **phase** encoded (309-313).

ADVANTAGE - Reduces total number of views required to reconstruct multiple **images**. Shortens scan time.

Dwg. 3/6

Abstract (Equivalent): US 5168226 A
The NMR system includes a **polarising magnetic field** generator, an excitation device for generating an **RF** excitation magnetic **field** which produces trasverse **magnetisation** in spins subjected to the **polarising magnetic field**. A receiver senses a **NMR signal** produced by the **transverse magnetisation** and produces digitsed samples f the **NMR signal**. A magnetic **field** gradient is generated to **phase** encoder the **NMR signal** . A pulse controller is coupled to the excitation device gradient generator and receiver. The pulse controller is operable to conduct a scan in which a series of pulse sequences are conducted to acquire digitised samples of **NMR signals** which enable a number of **images** to be reconstructed.

A set of **image** array are each coupled to the receiver and each stores digitised samples of the **NMR signals** required to reconstruct an **image**. Each pulse sequence conducted during the scan produces a series of **NMR signals** that are acquired and each signal in the pulse sequence is separately **phase** encoded common high-order **phase** encoding data is used for all the **images**.

USE/ADVNATAGE - For acquisition of multiple **images** in **fast spin** echo NMR scans, partic. clinical MR. Reduced total number of views required to reconstruct multiple **images**, shortened scan time.

Dwg.5/6

59/9/17 (Item 10 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009603347
WPI Acc No: 1993-296895/199338
XRPX Acc No: N93-228838
Gradient moment nulling for **fast spin** NMR sequence - suppressing first moment of gradients at each **RF** refocusing pulse in sequence, and nulling first moments at each acquired **NMR** echo **signal**
Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: HINKS R S
Number of Countries: 003 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 561628	A1	19930922	EP 93302025	A	19930317	199338	B
US 5280244	A	19940118	US 92854515	A	19920319	199404	
EP 561628	B1	19970604	EP 93302025	A	19930317	199727	
DE 69311175	E	19970710	DE 611175	A	19930317	199733	
			EP 93302025	A	19930317		

Priority Applications (No Type Date): US 92854515 A 19920319
Abstract (Basic): EP 561628 A
The method of suppressing **image** artifacts in an NMR system involves using a CPMG NMR pulse sequence to derive **images**. 90 deg. **RF** excitation pulses are generated in the presence of gradient pulse to give **transverse magnetisation** in a slice and re-enforced by 180 deg. **RF** refocusing pulses. The 180 deg. pulses occur every 14 milliseconds and 7 milliseconds after the 90 deg. pulse. The spin echoes are separately **phase** encoded by pulses of different magnitudes.

The gradient pulses (350-352) have a symmetrical form of -1,+2,-1 and are applied at each echo signal to null the first moment of the readout gradient at the centre of the refocusing pulses.

ADVANTAGE - Reduces motion artifacts in reconstructed **images** allowing faster **image** acquisition times.

Dwg.4a/6

Abstract (Equivalent): EP 561628 B
A method of suppressing **image** artifacts caused by flowing nuclear spins which produce **phase** errors in the **NMR** echo **signals** acquired during a CPMG pulse sequence, the method comprising: (a) producing **transverse magnetization** in a region of interest by applying an **RF** excitation **field** pulse to the nuclear spins in the region of interest in the presence of a first **magnetic field** gradient and a **polarizing magnetic field**; (b) refocusing the **transverse magnetization** by applying a series of **RF** refocusing **field** pulses to the nuclear spins in the region of interest to produce a corresponding series of **NMR** echo **signals**; (c) **phase** encoding each **NMR** echo **signal** by applying a second magnetic **field** gradient to the nuclear spins in the region of interest during the interval after each **RF** refocusing **field** pulse and prior to its corresponding **NMR** echo **signal**; (d) acquiring each **NMR** echo **signal** in the presence of a third magnetic **field** gradient; and (e) modifying at least one of said first, second and third magnetic **field** gradients such that the first moment of said magnetic **field** gradient is substantially zero at the centre of each of said **RF** refocusing **field** pulses.

Dwg.1/6

Abstract (Equivalent): US 5280244 A
The method involves producing **transverse magnetization** in a region of interest by applying an **RF** excitation **field** pulse to the nuclear spins in the region of interest in the presence of a first **magnetic field** gradient and a **polarizing magnetic field**.

The **transverse magnetization** is refocussed by applying a series of **RF** refocusing **field** pulses to the nuclear spins in the region of interest to produce a corresponding series of

NMR echo **signals**.

Each **NMR** echo **signal** is **phase** encoded by applying a second magnetic **field** gradient to the nuclear spins in the region of interest during the interval after each **RF** refocusing **field** pulse and prior to its corresponding **NMR** echo **signal**.

Each **NMR** echo **signal** is acquired in the presence of a third magnetic **field** gradient. At least one of the three magnetic **field** gradients is modified such that the first moment of said magnetic **field** gradient is substantially zero at the centre of each of said **RF** refocusing **field** pulses.

ADVANTAGE - Improves CPMG NMR pulse sequence in reconstructed **image**.

Dwg.1/6

Title Terms: GRADIENT; MOMENT; NULL; FAST; SPIN; NMR; SEQUENCE; SUPPRESS; FIRST; MOMENT; GRADIENT; **RF**; PULSE; SEQUENCE; NULL; FIRST; MOMENT; ACQUIRE; NMR; ECHO; SIGNAL

Derwent Class: S01; S03; S05

International Patent Class (Main): G01R-033/20; G01R-033/56

File Segment: EPI

Manual Codes (EPI/S-X): S01-E02A; S01-H05; S03-E07A; S05-D02B2

59/9/16 (Item 9 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009886842 **Image available**
WPI Acc No: 1994-166757/199420
Related WPI Acc No: 1994-285640
XRPX Acc No: N94-131302
Nuclear magnetic resonance system for measurement of human tissue etc. - modifies amplitude of nutation angle produced in spins by corresponding **RF** re-focussing pulses to stabilise magnitude of early **NMR** echo **signals** during each slot
Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: HINKS R S; LE ROUX P L
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5315249	A	19940524	US 92920952	A	19920728	199420	B

Priority Applications (No Type Date): US 92920952 A 19920728
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5315249	A		12	G01R-033/20	

Abstract (Basic): US 5315249 A
The NMR system generates a **polarising magnetic field**, and an excitation device generates an **RF** excitation magnetic **field** which produces **transverse magnetization** in spins subjected to the **polarizing magnetic field**. A receiver senses an **NMR signal** produced by the **transverse magnetization** and produces digitised samples of the **NMR signal**. Gradient devices generate magnetic **field** gradients to **phase** encode and frequency encode the **NMR signal**.

A pulse controller is coupled to the excitation device, the gradient devices, receiver, and conducts a **fast spin** echo pulse sequence in which a series of **NMR** echo **signals** are produced in response to a single **RF** excitation pulse followed by a corresponding series of **RF** refocusing pulses produced by the excitation device, and in which the **NMR** echo **signals** are stabilised to a smoothly decaying amplitude by altering the flip angle produced by one or more of the initial **RF** refocusing pulses in the series.

ADVANTAGE - Reduced **image** artifacts

Dwg.4/6

62/9/10 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013476790 **Image available**
WPI Acc No: 2000-648733/200063
XRPX Acc No: N00-480954
Production method for **image** using **fast spin** echo in **MRI** system
Patent Assignee: GENERAL ELECTRIC CO (GENE); GE MEDICAL SYSTEMS GLOBAL TECHNOLOGY CO (GENE)
Inventor: LE ROUX P H; LE ROUX P L
Number of Countries: 027 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1037067	A1	20000920	EP 2000302120	A	20000315	200063	B
JP 2000262489	A	20000926	JP 200064269	A	20000309	200063	
US 6265873	B1	20010724	US 99271629	A	19990317	200146	

Priority Applications (No Type Date): US 99271629 A 19990317
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1037067	A1	E	16	G01R-033/561	

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2000262489	A		11	A61B-005/055	
US 6265873	B1			G01R-033/20	

Abstract (Basic): EP 1037067 A1
NOVELTY - The method involves producing **transverse magnetization** in a region of interest by producing an **RF** excitation pulse (400) at a reference **phase**. A series of **RF** refocusing pulses is produced at regular intervals following the first step. The **phase** of successive **RF** refocusing pulses is advanced by an amount which increases as the function of a sweep factor and the square of an index i. A first set of **NMR** echo **signals** (404) is acquired following the odd numbered **RF** refocusing pulses (402). The acquired data is stored in an S odd k-space data set. A second set of **NMR** echo **signals** (404) is acquired following even numbered **RF** refocusing pulses. The acquired data is stored in an S even k-space data set. Finally an **image** is reconstructed by Fourier transforming and combining both k-space data sets.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for an **MRI** system.
USE - For nuclear magnetic resonance **imaging**.
ADVANTAGE - Improved **fast spin** echo pulse sequence.
DESCRIPTION OF DRAWING(S) - The figure shows the **fast spin** echo pulse sequence.
RF excitation pulse (400)
RF refocusing pulses (402)
NMR echo **signals**. (404)
pp; 16 DwgNo 4/5
Title Terms: PRODUCE; METHOD; **IMAGE**; FAST; SPIN; ECHO; **MRI**; SYSTEM

59/9/15 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX

010017928 **Image available**
WPI Acc No: 1994-285640/199435
Related WPI Acc No: 1994-166757
XRPX Acc No: N94-224882

Stabilised **fast spin** echo NMR pulse sequence with improved slice selection - reduces **image** artifacts in **FSE** pulse sequences by producing **RF** refocussing pulses which stabilise magnitude of acquired spin echo signals

Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: HINKS R S; LEROUX P L
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5345176	A	19940906	US 92920952	A	19920728	199435	B
			US 9392172	A	19930715		

Priority Applications (No Type Date): US 9392172 A 19930715; US 92920952 A 19920728

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5345176	A		11	G01R-033/48	CIP of application US 92920952
					CIP of patent US 5315249

Abstract (Basic): US 5345176 A

The NMR device comprises device for generating a **polarizing magnetic field**, excitation device for generating an **RF** excitation magnetic **field** which produces **transverse magnetization** in spins subjected to the **polarizing magnetic field** and receiver for sensing an **NMR signal** produced by the **transverse magnetization** and producing digitized samples of the **NMR signal**. A first gradient device generates a first magnetic **field** gradient to **phase** encode the **NMR signal** and a second gradient device generates a second magnetic **field** gradient to frequency encode the **NMR signal**. A pulse control device is coupled to the excitation device, first gradient device, second gradient device, and receiver device,

The pulse control device conducts a **fast spin** echo pulse sequence in which a series of **NMR** echo **signals** are produced in response to a corresponding series of **RF** refocusing pulses produced by the excitation device, and in which a set of **NMR** echo **signals** following the first **NMR** echo **signal** in the series of **NMR** echo **signals** are stabilized to have a similar amplitude (S) by altering the flip angle produced by **RF** refocusing pulses in the series, and the flip angle (theta) produced by the first **RF** refocusing pulse in the series is set to the same flip angle (theta) as that of the second **RF** refocusing pulse in the series.

USE/ADVANTAGE - To stabilise a series of **NMR** spin echo **signals** without exceeding the **RF** power capabilities of the system or sacrificing slice or slab selection capability.

Dwg.6/6

59/9/14 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011871946 **Image available**
WPI Acc No: 1998-288856/199826
XRPX Acc No: N98-227161

Magnetic resonance **imaging** system applicable in conjunction with **fast-spin** echo **imaging**, such as single shot **imaging** - has transmitter and **gradient** amplifiers which transmit **radio** frequency and current pulses to selected pairs of whole body **gradient** coils to create **magnetic field gradients** along axes of examination region

Patent Assignee: PICKER INT INC (PXRM)
Inventor: BEARDEN F H; DEMEESTER G D; LIU H
Number of Countries: 026 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 845684	A1	19980603	EP 97309010	A	19971110	199826	B
JP 10155769	A	19980616	JP 97325703	A	19971127	199834	
US 5825185	A	19981020	US 96757153	A	19961127	199849	

Priority Applications (No Type Date): US 96757153 A 19961127
Abstract (Basic): EP 845684 A

The **magnetic** resonance **imaging** system (10) includes a magnet (14) for generating temporally **constant magnetic field** through an examination region (16), a **radio** frequency pulse controller and transmitter (24) for both exciting and manipulating **magnetic** dipoles in the examination region, with the excitation of the **magnetic** dipoles being cyclic with repeat time (TR), and **gradient magnetic field** coils (22) and a **gradient magnetic field** controller (20) for generating at least phase and read **magnetic field gradient** pulses in **orthogonal** directions across the examination region such that **radio** frequency **magnetic** resonance echoes are generated. A receiver (26) receives and demodulates the **radio** frequency **magnetic** resonance echoes to produce a series of data lines, and an **image** processor (80-132) reconstructs an **image** representation from the data lines, in which there is provided a phase-correction parameter generator (86) which generates a number of phase-correction vectors.

The phase correction generator includes an echo centre position processor (96) for calculating the relative echo centre position for each of a number of echo positions in the repeat time of the sequence. A complex sum processor (104) receives the echo centre positions and calibrates data lines from the echo positions and independently computes a complex phase correction vector from it for each of the echo positions, and a correction processor (116) corrects each **imaging** data line with a positionally corresponding one of the correction vectors prior to reconstruction of the **image** representation. The phase-correction parameter generator includes a multiplication circuit (90) which multiplies a Fourier transformed reference echo data line, pixel by pixel, by a complex conjugate calibration data line corresponding to each one of the echo positions or may include a one-dimensional inverse Fourier transform processor (92) for receiving data lines from the multiplication circuit and processing the data lines corresponding to each echo position to generate an auxiliary data array in time domain for all echo positions.

ADVANTAGE - Improved phase correction is provided, line artifacts in phase encode direction are reduced or eliminated, and additional hardware and hardware modifications are not required. **Image** quality is improved, by improving spatial resolution and reducing Gibbs ringing and distortion.

Dwg.2A/6

59/9/13 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012021613 **Image available**
WPI Acc No: 1998-438523/199838
Related WPI Acc No: 2000-204408
XRPX Acc No: N98-341643

System which reduces Maxwell **field** artifacts with **fast spin** echo magnetic resonance **images**, e.g. in medical applications - used in **MRI** system which includes magnetic gradient generating appliances

Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: BERNSTEIN M A; TAN G; ZHOU X
Number of Countries: 005 Number of Patents: 005
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 19801808	A1	19980813	DE 1001808	A	19980119	199838	B
JP 10290795	A	19981104	JP 9829428	A	19980212	199903	
US 6008647	A	19991228	US 9737599	A	19970211	200007	
			US 97831684	A	19970410		
IL 123224	A	20000928	IL 123224	A	19980208	200063	
CN 1190572	A	19980819	CN 98104098	A	19980211	200274	

Priority Applications (No Type Date): US 97831684 A 19970410; US 9737599 P 19970211

Abstract (Basic): DE 19801808 A

The method applies to a nuclear magnetic resonance system with an appliance (140) for generating a **polarisation magnetic field**, an excitation appliance (150) generating an **h. f.** magnetic **field** to produce **transverse magnetization** in the spin subjected to the **polarisation field** and a receiver appliance (150) to acquire the nuclear magnetic **resonance signals** generated by the **transverse magnetization** and generate digitalized scanning signals from them. A first gradient appliance generates magnetic **field** gradients for **phase** coding the **resonance signals**, a second a **field** gradients for frequency coding of the **resonance signals** and a third **field** gradients to select the region from which the **resonance signals** are to be taken. A pulse control equipment is connected to all the above appliances. This can perform a scan in which one pulse sequence acquires the digitalized **resonance signals** which enable the reconstruction of an **image** to be performed.

During scanning the pulse control appliance can be used to provide a rapid spin echo sequence with which a sequence of **h.f.** refocussing pulses is generated by the excitation appliance to generate a corresponding sequence of nuclear **resonance** spin echo **signals**. At the same time a pair of refractive gradient pulses are generated by the third gradient appliance which surround each refocussing **h.f.** refocussing pulse and it also generates a compensation gradient during an interval contiguous with the first pulse of the **h.f.** refocussing sequence. Its purpose is to reduce the **image** artifacts generated by the Maxwell **fields**

USE - With fast **imaging** methods for clinical MR.

ADVANTAGE - Suppresses effect of Maxwell **fields** on scanned **images** by changing gradient signal characteristics.

59/9/12 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012335605 **Image available**
WPI Acc No: 1999-141712/199912
XRPX Acc No: N99-103000
Fast spin echo motion artifact reduction type **magnetic** resonance **imaging** system - allows maintenance of inter-echo spacing
Patent Assignee: PICKER INT INC (PXRM)
Inventor: STECKNER C M
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5865747	A	19990202	US 9617355	A	19960426	199912	B
			US 97837704	A	19970422		

Priority Applications (No Type Date): US 9617355 P 19960426; US 97837704 A 19970422
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5865747	A		7	A61B-005/055	Provisional application US 9617355

Abstract (Basic): US 5865747 A
A magnet generates temporally **constant magnetic field** through an examination region (14). A transmitter (24) excites dipoles in the examination region such that **radio** frequency **resonance signals** are generated. **Gradient** amplifiers (20) and **gradient** coils (22) are provided for generating **phase** and lead **magnetic field gradient** pulses along **orthogonal** axes across the examination region. The transmitter and the **gradient** amplifiers are controlled by a sequence controller (40) to cause excitation followed by echo generation for generating sets of views. The **radio** frequency **magnetic resonance signals** read during the read **gradients** are received and demodulated by a receiver (38) to produce the sets of views. A receiver gating circuit connected to the sequence controller, controls the receiver to process even numbered echoes and odd numbered echoes which occur after a threshold number of echoes. A reconstruction processor reconstructs the sets of rows into **image** representations which are then stored in an **image** memory.

USE - None given.

ADVANTAGE - Reduces **fast spin** echo motion artifacts while maintaining inter-echo spacing same as an uncompensated **FSE** sequence. Reduces **gradient** demands and eddy current and increases signal to noise ratio. The figure shows the **magnetic** resonance **imaging** system. Examination region (14), **Gradient** amplifier (20), **Gradient** coil (22), Transmitter (24), Receiver (38), Sequence controller (40).

Dwg.1/2

59/9/11 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013258558 **Image available**
WPI Acc No: 2000-430441/200037
XRPX Acc No: N00-321164

Magnetic resonance **imaging** system includes view sorter to sort views read out from echoes between first and second **images**

Patent Assignee: PICKER INT INC (PXRM)
Inventor: GULLAPALLI R P; LONCAR M J
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6075362	A	20000613	US 96688714	A	19960731	200037	B

Priority Applications (No Type Date): US 96688714 A 19960731
Abstract (Basic): US 6075362 A

NOVELTY - After inducing **magnetic** dipoles in the examination region, several **phase** encoded and frequency encoded echoes are induced, for generating first and second **image** echoes with different effective echo times. The echoes of each **image** closest to selected echo time is **phase** encoded with a minimal **phase** encoding. A view sorter sorts the views read out from echoes between first and second **images**.

DETAILED DESCRIPTION - A temporarily **constant magnetic field** is generated in an examination region. Dipoles are induced in the examination region for generating **radio** frequency **resonance signals**. **Gradient** amplifiers and **gradient magnetic field** coils generate slice select, **phase** and read **magnetic field gradient** pulses along **orthogonal** axes across examination region. A receiver demodulates the **radio** frequency **magnetic resonance signals** read during the read **gradients** to produce series of views. An INDEPENDENT CLAIM is also included for **magnetic** resonance **imaging** method.

USE - In dual contrast **fast spin** echo **imaging** techniques.

ADVANTAGE - Enables reduced scan times and selects effective echo times for both **images** of a dual contrast technique by using sequence controller.

DESCRIPTION OF DRAWING(S) - The figure shows the illustration of **magnetic** resonance **imaging** system.

pp; 10 DwgNo 1/4

62/9/11 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012775590 **Image available**
WPI Acc No: 1999-581816/199950
XRPX Acc No: N99-429689
Fast spin-echo signal pulse-train generating method for diffusion-weighted **imaging** in medical **MRI**
Patent Assignee: GENERAL ELECTRIC CO (GENE)
Inventor: MCKINNON G C
Number of Countries: 004 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 19905720	A1	19990930	DE 1005720	A	19990211	199950	B
JP 11267111	A	19991005	JP 9926798	A	19990204	199953	
CN 1234508	A	19991110	CN 99102327	A	19990213	200012	
US 6078176	A	20000620	US 96745602	A	19961108	200035	
			US 9823572	A	19980213		

Priority Applications (No Type Date): US 9823572 A 19980213; US 96745602 A 19961108
Abstract (Basic): DE 19905720 A1
NOVELTY - Generates diffusion-weighted **transverse** spin **magnetization**.
DETAILED DESCRIPTION - The method has the first step of applying **transverse magnetization** by an **RF** excitation pulse and a bipolar gradient pulse to obtain diffusion weighting. Then first gradient pulse shifts the phase of **transverse magnetization**. An **RF** pulse switches longitudinal-axis components to ensure **transverse magnetization**. Second bipolar gradient pulse is applied. The **FSE** pulse train is obtained by **magnetization** in the **transverse** plane and **RF** post-focussing. The picture is reconstructed from the echo signals.
USE - In generating NMR **image** for clinical **MRI** using **FSE** pulse sequences.
ADVANTAGE - Reduced oscillation in amplitude of echo signal. Improved **FSE** pulse train.
DESCRIPTION OF DRAWING(S) - The figure shows a block diagram applying the invention.
operating console (100)
computer system (107)
high-speed link (115)
system control (122)
amplifiers (127)
sample space interface (133)
gradient coils (139)
polarization magnets (140)
magnet (141)
amplifiers (151,153)
transmit/receive switch (154)
array processor (161)
pp; 10 DwgNo 1/5
Title Terms: FAST; SPIN; ECHO; SIGNAL; PULSE; TRAIN; GENERATE; METHOD;

59/9/10 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013319861 **Image available**
WPI Acc No: 2000-491799/200044
XRPX Acc No: N00-364917
Magnetic resonance **imaging** process - creates measurement cycle of series of pulse sequences with **HF** excitation pulse and magnetic **field** gradient pulse to rephase core **magnetization** of object being investigated
Patent Assignee: SIEMENS AG (SIEI)
Inventor: HEID O
Number of Countries: 003 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 19903029	A1	20000803	DE 1003029	A	19990126	200044	B
JP 2000217801	A	20000808	JP 200013354	A	20000121	200052	
US 6369569	B1	20020409	US 2000487279	A	20000119	200227	

Priority Applications (No Type Date): DE 1003029 A 19990126
Abstract (Basic): DE 19903029 A

Pulse sequences are formed with a **HF** excitation pulse and magnetic **field** gradient pulse to completely rephase the core **magnetization** of an object caused by the **HF** excitation pulse. The pulse creation is interrupted and later started anew after a fixed number of measurement cycles showing repetitions and before reaching a driven steady state of the core **magnetization**.

Between the series of measurement cycles there are measurement breaks for the relaxation of the core **magnetization** in the thermal stead state. Before the start of each measurement cycle, a preparation pulse sequence is created to prepare the object to be investigated. The preparation process involves a fat saturation process using an inversion recovery procedure, a saturation pulse procedure, a **driven equilibrium** Fourier transformation procedure or a diffusion pulse procedure.

USE - For **imaging** of abdomen, pleural cavity where movement of patient is unavoidable.

ADVANTAGE - Short measurement times and good tissue contrast.

Dwg.1/1

59/9/9 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013742281 **Image available**
WPI Acc No: 2001-226511/200123
XRPX Acc No: N01-160976
Magnetic resonance **imaging** system for medical diagnosis, generates **image** with spatial variations in **phase** of specimen **magnetization**, based on magnetic **resonance signals** from specimen
Patent Assignee: US DEPT HEALTH & HUMAN SERVICES (USSH)
Inventor: ALETRAS A H; WEN H
Number of Countries: 095 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200111380	A2	20010215	WO 2000US21299	A	20000804	200123	B
AU 200065185	A	20010305	AU 200065185	A	20000804	200130	
EP 1210614	A2	20020605	EP 2000952497	A	20000804	200238	
			WO 2000US21299	A	20000804		

Priority Applications (No Type Date): US 2000201056 P 20000501; US 99147314 P 19990805; US 99165564 P 19991115
Abstract (Basic): WO 200111380 A2

NOVELTY - The magnet and **radio** frequency transmitter respectively applies magnetic **field** and **radio** frequency pulse on specimen to label **phase** of **magnetization** of specimen with selected spatial function. The **radio** frequency receiver detects magnetic **resonance signals** from specimen based on which **image** including spatial variations in **phase** of **magnetization** of specimen is generated.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) Free induction decay contribution reducing method;
(b) Specimen motion mapping method;
(c) Magnetic resonance **imaging** method;
(d) **Phase** encoded displacement data acquiring method;
(e) Dual echo magnetic resonance **imaging** method;
(f) Strain data displaying method;
(g) **Phase** wrap correcting method

USE - For use by clinicians in medical diagnostics such as heart diagnosis.

ADVANTAGE - Improves signal-to-noise ratio, as **phase** of **magnetization** of specimen is labeled.

DESCRIPTION OF DRAWING(S) - The figure shows **RF** and gradient pulse applied system in **fast spin** echo read out of **phase** labeled **transverse magnetization**.

pp; 48 DwgNo 5/14

Title Terms: MAGNETIC; RESONANCE; **IMAGE**; SYSTEM; MEDICAL; DIAGNOSE; GENERATE; **IMAGE**; SPACE; VARIATION; **PHASE**; SPECIMEN;

59/9/8 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014338005 **Image available**
WPI Acc No: 2002-158708/200221
XRPX Acc No: N02-120928

Fast spin echo and echo planar **imaging** based **magnetic** resonance **imaging** of insitu blood flow studies, forms separate **images** from odd/even numbered echo signals to construct composite **image**

Patent Assignee: TOSHIBA KK (TOKE); KUHARA S (KUHA-I)
Inventor: KUHARA S
Number of Countries: 002 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2001327480	A	20011127	JP 200165256	A	20010308	200221	B
US 20020000805	A1	20020103	US 2001803023	A	20010312	200221	

Priority Applications (No Type Date): JP 200070944 A 20000314
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2001327480	A		12	A61B-005/055	
US 20020000805	A1			A61B-005/55	

Abstract (Basic): JP 2001327480 A

NOVELTY - Principally, the **fast spin** echo (FSE) based **image** formation depends on an echo train formed out of high frequency **magnetic field** reversals by use of 180degrees duration pulses. **Images** arising out of odd/even numbered echoes are separately constructed and a composite **image** whose amplitude is the square root of the sum of the squared amplitudes of the odd/even **image** signals, is generated.

DETAILED DESCRIPTION - The pulse sequence controller (10) oversees the generation of pulses impressed upon the **gradient magnetic field** coil (3) and from the echo data collected by the module (11), the odd/even echo train based **images** are presented over the display (14). The main **static field** coil (1), the **RF** transmitting coil (2) and the **RF** receiving coil array (41,42) are standard.

USE - Multiecho techniques enable fast **magnetic** resonance **image** formation, so essential in the monitoring of dynamic **images** e.g. those involved in blood flow studies.

ADVANTAGE - Reduces the number of functional devices employed in blood flow monitoring without loss of **image** capture speed or deterioration of S/N ratio.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of **magnetic** resonance **imaging** device. (Drawing includes non-English language text).

Main **static field** coil (1)
RF transmitting coil (2)
Magnetic field coil (3)
Pulse sequence controller (10)
Module (11)
Display (14)
RF receiving coil array (41,42)
pp; 12 DwgNo 4/12

Title Terms: FAST; SPIN; ECHO; ECHO; PLANE; **IMAGE**; BASED; **MAGNETIC**; RESONANCE; **IMAGE**; BLOOD; FLOW; STUDY; FORM;

59/9/4 (Item 1 from file: 987)
DIALOG(R)File 987:TULSA (Petroleum Abs)

01041068 PETROLEUM ABSTRACTS NO.: 779306
NUCLEAR MAGNETIC RESONANCE METHODS FOR EXTRACTING INFORMATION ABOUT A FLUID IN A ROCK
AUTHOR (INVENTOR): HURLIMANN M D; TERNEAUD O J; FREED D
PATENT ASSIGNEE: SCHLUMBERGER SERV PETROL; SCHLUMBERGER CANADA LTD; PRAD RESEARCH & DEVELOP NV; SCHLUMBERGER TECHNOL BV; SCHLUMBERGER OVERSEAS SA; SCHLUMBERGER SURENCO SA; SCHLUMBERGER HOLDINGS LTD
PATENT INFORMATION: WORLD 02/08789A2, P 1/31/2002, F 7/20/2001, PR US 7/21/2000 (APPL 60/220053) (G01V) (39 PP; 34 CLAIMS)
PATENT (NO, DATE): WO 0208789A 2 20020131
APPLICATION (NO, DATE): 20010720
PRIORITY (NO, DATE): US 60220053 20000721
PUBLICATION YEAR: 2002
LANGUAGE: ENGLISH
DOCUMENT TYPE: PATENT; P
Nuclear magnetic resonance methods for extracting information about a fluid in a rock are described. A system of nuclear spins in the fluid are prepared in a **driven equilibrium**, and a series of magnetic **resonance signals** are generated from the fluid. The series of magnetic **resonance signals** is detected and analyzed to extract information about the fluid in the rock
PRIMARY DESCRIPTOR: NUCLEAR MAGNETIC LOGGING
MAJOR DESCRIPTORS: FORMATION EVALUATION; **IMAGING**; INTERPRETATION;

59/9/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

13573794 22106789 PMID: 12111926

On the application of a non-CPMG single-shot **fast spin**-echo sequence to diffusion tensor **MRI** of the human brain.

Bastin Mark E; Le Roux Patrick

Department of Medical and Radiological Sciences (Medical Physics), University of Edinburgh, Western General Hospital, Edinburgh, UK. meb@skull.dcn.ed.ac.uk

Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine (United States) Jul 2002, 48 (1) p6-14, ISSN 0740-3194
Journal Code: 8505245

Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS

The strong sensitivity of Carr-Purcell-Meiboom-Gill (CPMG) **fast spin**-echo (**FSE**) sequences, such as rapid acquisition with relaxation enhancement (RARE), to the phase of the prepared **transverse magnetization** means that artifact-free single-shot diffusion-weighted **images** can currently only be obtained with a 30-50% reduction in the signal-to-noise ratio (SNR). However, this phase sensitivity and signal loss can be addressed in **FSE** sequences that use quadratic phase modulation of the **radiofrequency** (**RF**) refocusing pulses to generate a sustained train of stable echoes. Here the first application of such a non-CPMG single-shot **FSE** (ssFSE) sequence to diffusion tensor MR **imaging** (DT-**MRI**) of the human brain is described. This approach provides high SNR diffusion-weighted **images** that have little or no susceptibility to poor B(0) magnetic **field** homogeneity and the strong eddy currents typically present in DT-**MRI** experiments.

Tags: Human

62/9/4 (Item 1 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

13170803 BIOSIS NO.: 200100377952
Hyperechoes.
AUTHOR: Hennig Juergen(a); Scheffler Klaus
AUTHOR ADDRESS: (a)Dept. of Diagnostic Radiology, Hugstetterstr. 55, Section of Medical Physics, 79106, Freiburg: hennig@nz11.ukl.uni-freiburg.de**Germany
JOURNAL: Magnetic Resonance in Medicine 46 (1):p6-12 July, 2001
MEDIUM: print
ISSN: 0740-3194
DOCUMENT TYPE: Article
RECORD TYPE: Abstract
LANGUAGE: English
SUMMARY LANGUAGE: English

ABSTRACT: A novel **spin-echo**-based refocusing strategy called a hyperecho mechanism is introduced by which the full coherence of **magnetization** submitted to a sequence of arbitrary **RF** pulses can be reinstalled. First implementations illustrate the potential of hyperecho formation - especially for Rapid Acquisition with Relaxation Enhancement (RARE) **imaging**, in which the full **image** intensity can be retrieved using a fraction of the **RF** power of a fully refocused sequence. The contribution of stimulated echo pathways to the hyperecho signal leads to an increased signal intensity at a given refocusing time for tissues with T1 > T2. For identical T2 contrast, longer echo times have to be used. Further possibilities for using hyperechoes in gradient-echo sequences and for spin selection are discussed.

MAJOR CONCEPTS: Radiology (Medical Sciences); Radiation Biology
METHODS & EQUIPMENT: Rapid Acquisition with Relaxation Enhancement **imaging--imaging** method; hyperecho **driven equilibrium** Fourier transform--**imaging** method
MISCELLANEOUS TERMS: gradient-echo sequence; hyperecho; **magnetization**; **radiofrequency** pulses; signal intensity

59/9/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

10935033 20499559 PMID: 11042644

MR **imaging** in the presence of vascular stents: A systematic assessment of artifacts for various stent orientations, sequence types, and **field** strengths.

Klemm T; Duda S; Machann J; Seekamp-Rahn K; Schnieder L; Claussen C D; Schick F

Department of Diagnostic Radiology, University of Tubingen, D-72076 Tubingen, Germany.

Journal of magnetic resonance imaging : JMRI (UNITED STATES) Oct 2000, 12 (4) p606-15, ISSN 1053-1807 Journal Code: 9105850

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: Completed

Subfile: INDEX MEDICUS

A systematic evaluation of the potential quality of **magnetic** resonance **images** recorded in the presence of metallic stents was performed on a low-**field** open **imager** operating at 0.2 T and on a high-**field** closed unit operating at 1.0 T. Eight different stent types were examined by two-dimensional **gradient**-echo sequences with echo times of 4 and 10 msec and by a **fast spin**-echo technique. In addition, a three-dimensional **gradient**-echo sequence was applied with an echo time of 2.4 msec. A set of sequence and slice parameters was used on both scanners. Thus, artifacts due to susceptibility effects depending on the **magnetic field** strength could be distinguished from **radiofrequency** shielding effects in the lumen of the stents (independent of the **field** strength). Nine different **orthogonal** orientations of the stent axis and the **image** (in terms of slice, read, and phase-encoding direction) were tested, and the artifacts (extension of signal void and visibility of the lumen) were compared. The optimal strategy for visualization of vascular and perivascular regions outside the stents was **fast spin**-echo **imaging** with the stent axis and read direction parallel to the **static field**. Susceptibility-induced signal void in **gradient**-echo **images** was minimal using the three-dimensional approach. Increased transmitter amplitudes above usual values provided clearly improved insight in the lumen using **gradient**-echo sequences. Copyright 2000 Wiley-Liss, Inc.

Tags: Human; In Vitro; Support, Non-U.S. Gov't

62/9/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

09804024 98246720 PMID: 9585629
MRI symptomatology of non-tumoral myelopathies]
Semiologie irm des myelopathies non tumorales.
Iffenecker C; Mnif N; Fuerxer F; Benoudiba F; Doyon D
Hopital de Bicetre, Service de Neuroradiologie du Professeur Doyon, Le Kremlin Bicetre.
Journal of neuroradiology. Journal de neuroradiologie (FRANCE) Mar 1998 , 25 (1) p32-45, ISSN 0150-9861 Journal Code: 7705086
Document type: Journal Article ; English Abstract
Languages: FRENCH
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS
We present a retrospective study in order to analyze the abnormalities noted on **MRI** in 27 cases of myelopathy excluding tumors, explored between 1994 and 1996. The different lesions were: Multiple Sclerosis (n = 11), Spondylotic myelopathy (n = 3), Neurosarcoidosis (n = 4), CMV Myelitis (n = 1), Radiation Myelopathy (n = 1), Spinal Dural Arteriovenous Fistula (n = 1), Intramedullary Cysticercosis (n = 1), Infarct (n = 5). The exams have been made on 1.5 Tesla Magnetom Vision Siemens or GE Signa machine. All patients have had axial and sagittal views with coronal complementary study in 4 cases. Sequences were Spin echo pT1 (TR: 560, TE: 12), **Fast Spin** echo pT2 (TR: 3 500, TE: 99 or 128), and gradient echo pT2 (TR: 700, TE: 22, Angle: 25 degrees). Intravenous injection of Gadolinium has been made in 16 cases (0.1 mmol/kg). We have studied the presence or not of a signal abnormality in pT1 and/or in pT2, of enhancement, and its topography (cervical, thoracic, lumbar). We classified lesions in central and/or peripheral and according, to their topography in anterior, posterior or lateral type. The form has been classified in four types (nodular, triangular, "pen like", plage). Extension in **transversal** (superior or inferior to half medullary surface) and cranio-caudal directions (inferior to one vertebrae, between one and two vertebrae, superior to two vertebrae) has been also classified. Others intra or perimedullar and encephalic abnormalities have been noted. We analyzed the results for each pathology and underline the essential diagnosis criteria noted (low cranio-caudal and **transversal** extension with frequent triangular form of Multiple Sclerosis lesions, frequent suggestive abnormalities of the encephale (82%) in Multiple Sclerosis, intra and perimedullar enhancement with deformations of the surface of the spinal cord in Sarcoidosis' lesions, extended dorsolumbar "pen like" lesions with inconstant enhancement of infarcts, focal plage lesions centered on degenerative changes of the spinal canal in spondylotic myelopathy, bony lipomatous involution in front of intramedullary radiation plage lesion...) and also review the literature and confront their results to it. We insist on the difficulties in classifying myelopathy (**radio** -clinical terminology discordances, identical signal abnormalities frequently caused by different illness, necessity to compare to pathologic results). We propose a **MRI** study protocol that should interest the whole spinal cord and comport T1 weighted without and after gadolinium sequences, T2 weighted sequences (with always a gradient echo type). 2 or better 3 different plans should be made. A complementary study of the brain by **MRI** is often useful. Clinical study, biology, evolution, **MRI** and when possible pathology all are necessary to better understand myelopathy's mechanisms.
Tags: Female; Human; Male
Descriptors: Magnetic Resonance **Imaging**; *Spinal Cord Diseases

62/9/8 (Item 2 from file: 34)

06306901 Genuine Article#: YH250 Number of References: 21
Title: Non-Fourier encoding with multiple spin echoes
Author(s): Panych LP (REPRINT) ; Mulkern RV; Saiviroonporn P; Zientara GP; Jolesz FA
Corporate Source: HARVARD UNIV,BRIGHAM & WOMENS HOSP, SCH MED, DEPT RADIOL, 75 FRANCIS ST/BOSTON//MA/02115 (REPRINT); CHILDRENS HOSP,DEPT RADIOL/BOSTON//MA/02115; BOSTON UNIV,DEPT BIOMED ENGN/BOSTON//MA/02215
Journal: MAGNETIC RESONANCE IN MEDICINE, 1997, V38, N6 (DEC), P964-973
ISSN: 0740-3194 Publication date: 19971200
Publisher: WILLIAMS & WILKINS, 351 WEST CAMDEN ST, BALTIMORE, MD 21201-2436
Language: English Document Type: ARTICLE
Geographic Location: USA
Subfile: CC CLIN--Current Contents, Clinical Medicine
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING
Abstract: The advantages and limitations of multiple spin-echo sequences for non-fourier encoding are investigated, Complications caused by improper encoding of alternate **magnetization** pathways due to imperfect refocusing pulses are analyzed, It is shown that mirror **image** ghosts result if the encoding **RF** pulse matrix is real-valued, These ghosts can be avoided as long as the rows of the **RF** pulse matrix are conjugate symmetric, which implies that spatial profiles are real valued, Non-Fourier encoding using bases derived from wavelet, Hadamard, and other real-valued **orthogonal** functions does not result in a mirror ghost artifact, A RARE sequence for non-fourier encoding has been implemented on a clinical **imaging** system and successfully applied for brain **imaging**.
Descriptors--Author Keywords: magnetic resonance **image** encoding ; non-Fourier encoded **MRI** ; spatially selective **RF** excitation
Identifiers--KeyWord Plus(R): **MRI**; SEQUENCES; IMPLEMENTATION; EXCITATION; 2D
Research Fronts: 95-1616 002 (**FAST SPIN**-ECHO **IMAGING**; T2-WEIGHTED **IMAGES**; INVERSION-RECOVERY FAT **SIGNAL** SUPPRESSION; **MR** SEQUENCES)

62/9/6 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

03218401 JICST ACCESSION NUMBER: 97A0429570 FILE SEGMENT: JICST-E
Quantitative Evaluation of **Transverse** Relaxation Times in SE, **FSE** and SE-EPI.
KUBO HITOSHI (1); ARAKI AKINOBU (1); KINOSADA YASUTOMI (2); MATSUSHIMA SHIGERU (3)
(1) Mie Univ., Hosp.; (2) Kyoto Prefect. Univ. of Med.; (3) Aichi Cancer Center
Nippon Jiki Kyomei Igakkai Zasshi(Japanese Journal of Magnetic Resonance in Medicine), 1997, VOL.17,NO.2, PAGE.84-93, FIG.5, TBL.2, REF.10
JOURNAL NUMBER: X0020ABC ISSN NO: 0914-9457
UNIVERSAL DECIMAL CLASSIFICATION: 616-07-09
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: In clinical study, the differences of contrast or signal intensity have been shown among **fast spin** echo (**FSE**) **image**, spin echo type echo planar (SE-EPI) **image**, and spin echo (SE) **image**. The purpose of this study is to clarify the reason of changing contrast or signal intensity with a view point of **transverse** relaxation time (T2). T2 relaxation times were calculated using gelatin phantoms without and with either Mn or Fe material in and nine healthy volunteer's basal ganglia. **Imaging** was performed with SE, **FSE**, and SE-EPI sequences with a quadrature head coil on a standard Signa Horizon (GE, USA). Single scan and multi scan techniques have also been done for each of sequences. In phantom study, the result showed that T2 relaxation time calculated by **FSE** was longer than that calculated by SE, although T2 relaxation time calculated by SE-EPI was shorter than that calculated by SE. The relaxation time (T2) calculated by **FSE** or SE-EPI correlated with that calculated by SE significantly. For any kind of sequence, there was no difference between T2 relaxation times calculated using single and multi scans, and those two T2 relaxation times showed good correlation. In clinical study for normal volunteers, T2 relaxation times calculated by same sequences showed similar trends as in phantom study. This study suggested that the elevation of T2 relaxation time using **FSE** was due to the reduction of spin-dephasing by the J-coupling mechanism using a series of 180.DEG.**RF** pulses. On the other hand, the shortening of T2 relaxation time using SE-EPI was due to the effect of T2 decay. This study revealed that the differences of the contrast on various **images** obtained with SE, **FSE**, and SE-EPI depended strongly on the characteristics of their sequences. (author abst.)
DESCRIPTORS: spin echo; relaxation time

59/9/6 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05756604 Genuine Article#: WV936 Number of References: 17
Title: Design of adiabatic pulses for fat-suppression using analytic solutions of the Bloch equation
Author(s): Rosenfeld D (REPRINT) ; Panfil SL; Zur Y
Corporate Source: ELSCINT MRI CTR,POB 550/HAIFA//ISRAEL/ (REPRINT); TEL AVIV UNIV,SCH PHYS & ASTRON/TEL AVIV//ISRAEL/
Journal: MAGNETIC RESONANCE IN MEDICINE, 1997, V37, N5 (MAY), P793-801
ISSN: 0740-3194 Publication date: 19970500
Publisher: WILLIAMS & WILKINS, 351 WEST CAMDEN ST, BALTIMORE, MD 21201-2436
Language: English Document Type: ARTICLE
Geographic Location: ISRAEL
Subfile: CC CLIN--Current Contents, Clinical Medicine
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING
Abstract: Discrimination between signals produced by fat and by water is an important issue in **MRI**. One efficient approach is to perform fat-suppression by selective inversion, This technique exploits the transition region of a selective **RF** pulse to invert the longitudinal lipid **magnetization** while leaving the **magnetization** of the water protons untouched, The damaging effects of **RF field** inhomogeneity may be overcome by using pulses based on the adiabatic fast passage principle (AFP). In particular, the well-known sech/tanh adiabatic pulse is a robust and efficient pulse that is obtained as an analytic solution of the Bloch equation, In this paper, a wider class of analytic solutions of the Bloch equation is presented of which the sech/tanh **driving** function is merely a particular case. The new pulse exhibits an asymmetric distribution of **magnetization** with one transition sharper than the other, The sharper transition can be used to perform the required selective discrimination between signals, The resulting pulse features excellent adiabatic behavior, Moreover, the transition width of the new pulse can be reduced by a factor of about 2/3 with respect to an equal-duration sech/tanh pulse, The performance of the new pulse is compared with a similar sech/tanh pulse with the aid of a practical design example.
Descriptors--Author Keywords: **RF** pulse design ; adiabatic pulses ; fat suppression ; selective presaturation
Identifiers--KeyWord Plus(R): INVERSION RECOVERY SEQUENCE; ARTERIES
Research Fronts: 95-1616 001 (**FAST SPIN**-ECHO **IMAGING**;

59/9/5 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06335517 Genuine Article#: YJ661 Number of References: 15
Title: MR-guided biopsies with an ultrafast high-resolution T-2-weighted turbo spin echo sequence ''LoLo'': First clinical results
Author(s): Bucker A (REPRINT) ; Adam G; Neuerburg JM; Glowinski A; vanVaals JJ; Gunther RW
Corporate Source: RHEIN WESTFAL TH AACHEN,RADIOL DIAGNOST KLIN, FAK MED, PAUWELSSTR 30/D-52074 AACHEN//GERMANY/ (REPRINT); PHILIPS MED SYST,/BEST//NETHERLANDS/
Journal: ROFO-FORTSCHRITTE AUF DEM GEBIET DER RONTGENSTRAHLEN UND DER BILDGEBENDEN VERFAHREN, 1997, V167, N5 (NOV), P491-495
ISSN: 0936-6652 Publication date: 19971100
Publisher: GEORG THIEME VERLAG, P O BOX 30 11 20, D-70451 STUTTGART, GERMANY
Language: German Document Type: ARTICLE
Geographic Location: GERMANY; NETHERLANDS
Subfile: CC CLIN--Current Contents, Clinical Medicine
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING
Abstract: Purpose: The feasability of the ''LoLo''-technique for MR guidance of biopsy procedures was tested. Material and Methods: MR-guided biopsies were performed on 10 patients employing a 1.5 T system, The ''Lolo''-technique used is a single shot turbo spin echo technique. Only a small **field** of view is covered in order to yield **images** with a resolution of 1 mm(2) in 600 ms. The **orthogonal** orientation of the slice selective **radio** frequency pulses to each other prevents foldover artifacts. Results: No complications occurred. All biopsy procedures yielded sufficient material to diagnose the underlying disease. The ''LoLo''-technique enabled good depiction of the needle tip in all cases. T-2-weighted contrast typical for turbo spin echo **images** was observed. No foldover artifacts were detectable. Conclusion: MR-guided biopsies are possible with the ''LoLo''-technique. Compared to gradient echo sequences T-2-weighting and smaller susceptibility artifacts proved to be advantageous.
Descriptors--Author Keywords: interventions, MR-guided ; biopsies ; local look-technique (LoLo) ; **MRI**

62/9/9 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05381853 Genuine Article#: VU890 Number of References: 27
Title: CURVED SLICE **IMAGING**
Author(s): BORNERT P; SCHAFFTER T
Corporate Source: PHILIPS RES LABS,DEPT TECH SYST,RONTGENSTR 24-26/D-22335 HAMBURG//GERMANY/; UNIV BREMEN,FAC CHEM/BREMEN//GERMANY/
Journal: MAGNETIC RESONANCE IN MEDICINE, 1996, V36, N6 (DEC), P932-939
ISSN: 0740-3194
Language: ENGLISH Document Type: ARTICLE
Geographic Location: GERMANY
Subfile: SciSearch; CC CLIN--Current Contents, Clinical Medicine
Journal Subject Category: RADIOLOGY & NUCLEAR MEDICINE
Abstract: Curved slice **imaging** based on multidimensional **RF** pulses is introduced and discussed. This new approach makes it possible to **image** curved anatomical structures by using **MRI**. The 2D **RF** or 30 **RF** pulses used can be tailored to excite or refocus **transverse magnetization** of a previously defined arbitrarily curved slice profile in a 30 space. These **RF** pulses can be integrated into all standard **MRI** sequences to perform slice selection. The final curved slice **image** is obtained as a projection of the curved slice **magnetization** onto a selected **imaging** plane. The problem of ambiguities arising due to this projection process is addressed, Phantom and in vivo experiments were performed to illustrate the advantages and limitations of this approach.
Descriptors--Author Keywords: **MRI** ; CURVED SLICE ; 20 **RF** PULSE ; FUNCTIONAL **MRI**
Identifiers--KeyWords Plus: SELECTIVE EXCITATION PULSES; SPATIAL LOCALIZATION; GRADIENT; ZEUGMATOGRAPHY; BRAIN; **MRI**
Research Fronts: 94-4316 001 (**FAST SPIN**-ECHO; CONTINUING SEARCH FOR THE OPTIMAL MR-**IMAGING** PULSE SEQUENCE(S); BRAIN IN PATIENTS)

59/9/7 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05113618 Genuine Article#: VB005 Number of References: 96
Title: CHALLENGES FOR IN-VIVO HIGH-RESOLUTION **MRI**
Author(s): SCHMALBROCK P
Corporate Source: OHIO STATE UNIV,MRI FACIL/COLUMBUS//OH/43120
Journal: INTERNATIONAL JOURNAL OF NEURORADIOLOGY, 1996, V2, N1 (JAN-FEB), P 45-68
ISSN: 1079-8110
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch
Journal Subject Category: CLINICAL NEUROLOGY
Abstract: Analyses of the factors limiting spatial resolution in MR in vivo implicate as significant problems: (1) limitations on the signal-to-noise ratio including operator selected parameters, receiver bandwidth and **radio** frequency coils; (2) **field** strength and gradient limitations; (3) susceptibility effects; and (4) patient motion. Techniques for addressing these problems include design of new **radio** frequency coils, use of higher **field** strength magnets, use of novel pulse sequences, and improvements in data processing. For **MRI** of the head, available **signal**-to-noise ratio is the dominant limit on spatial resolution. This paper addresses ways to optimize the diverse interrelated factors that together determine **image** resolution.
Descriptors--Author Keywords: MAGNETIC RESONANCE, **IMAGE** PROCESSING ; MAGNETIC RESONANCE, PHYSICS ; MAGNETIC RESONANCE, SPATIAL RESOLUTION ; MAGNETIC RESONANCE, TECHNOLOGY
Identifiers--KeyWords Plus: MAGNETIC-RESONANCE MICROSCOPY; TO-NOISE RATIO; SUSCEPTIBILITY ARTIFACTS; **PHASED**-ARRAY; SPIN-ECHO; INNER-EAR; **TRANSVERSE MAGNETIZATION**; **FIELD** INHOMOGENEITIES; NMR

62/9/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

07541480 93066967 PMID: 1438747

Increased corneal temperature caused by MR **imaging** of the eye with a dedicated local coil.

Shellock F G; Schatz C J
Department of Radiological Sciences, UCLA School of Medicine.

Radiology (UNITED STATES) Dec 1992, 185 (3) p697-9, ISSN 0033-8419
Journal Code: 0401260
Contract/Grant No.: 1RO1 CA4414-04; CA; NCI
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Subfile: AIM; INDEX MEDICUS

To determine the existence of tissue heating-associated risks to the eye with magnetic resonance (MR) **imaging** performed at high specific absorption rates (SARs), corneal temperature was measured in 14 patients immediately before and after MR **imaging** performed with a 1.5-T, 64-MHz unit and a quadrature-**driven** body coil for **radio** -frequency transmission and a receive-only local coil designed for eye **imaging**. **Fast spin** -echo pulse sequences were used predominantly. Estimated peak SARs ranged from 3.3 to 8.4 W/kg. A statistically significant (P < .001) increase in average corneal temperature (32.2 degrees C +/- 0.7 before **imaging**, 33.1 degrees C +/- 0.6 after) was associated with MR **imaging** of the eye. The changes in corneal temperature ranged from 0.2 degrees to 1.8 degrees C (average, 0.9 degrees C). The highest corneal temperature measured after MR **imaging** was 35.1 degrees C. MR **imaging** performed with a dedicated local coil at the SARs studied produced elevations in corneal temperature that were physiologically inconsequential and below the temperature threshold (41 degrees to 55 degrees C) for **radio** -frequency radiation-induced cataractogenesis.

Tags: Female; Human; Male; Support, U.S. Gov't, P.H.S.
Descriptors: Body Temperature; *Cornea--physiology--PH; *Eye Diseases

59/9/3 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

07411967 92369693 PMID: 1823180
T2-weighted three-dimensional MP-RAGE MR **imaging**.

Mugler J P; Spraggins T A; Brookeman J R
Department of Radiology, University of Virginia Health Sciences Center, Charlottesville 22908.

Journal of magnetic resonance imaging : JMRI (UNITED STATES) Nov-Dec 1991, 1 (6) p731-7, ISSN 1053-1807 Journal Code: 9105850
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS

The application of three-dimensional (3D) **magnetization**-prepared rapid-**gradient**-echo (MP-RAGE) **imaging** to the acquisition of T2-weighted 3D data sets has been investigated, with a 90 degrees x-180 degrees y-90 degrees-x pulse set (**driven equilibrium**) for the T2 contrast preparation. A theoretical model was used to study the contrast behavior of brain tissue. The effects of **radio**-frequency and **static-field** inhomogeneities and eddy currents on the T2 contrast preparation and the effects of eddy currents on the **gradient** -echo acquisition resulted in blurring and intensity banding artifacts. With a multistep **gradient** preparation, these artifacts could be suppressed. With further development, this technique may yield a clinically practical method for obtaining T2-weighted 3D data sets of relatively large volumes (eg, the whole head) suitable for multiplanar reformatting.

Tags: Human; Support, Non-U.S. Gov't
Descriptors: **Image** Enhancement--methods--MT; ***Magnetic** Resonance **Imaging**--methods--MT; Artifacts; Brain --anatomy and

62/9/3 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

05521708 87256924 PMID: 6571572
Driven-equilibrium radiofrequency pulses in NMR **imaging**.
van Uijen C M; den Boef J H
Magnetic resonance in medicine : official journal of the Society of Magnetic Resonance in Medicine / Society of Magnetic Resonance in Medicine (UNITED STATES) Dec 1984, 1 (4) p502-7, ISSN 0740-3194
Journal Code: 8505245
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Subfile: INDEX MEDICUS
Driven-equilibrium pulse techniques are applied to NMR **imaging** to extend the possibilities of manipulating **image** contrasts in pulse sequences with a high repetition rate. In many cases the data acquisition time can be much shorter than in more conventional pulse techniques. Both calculations and experiments reveal that the intensity of tissue with slowly relaxing nuclear **magnetizations** can significantly be enhanced, thus facilitating the detection of a number of pathologies.
Tags: Human
Descriptors: *Magnetic Resonance Spectroscopy--methods--MT; Head--anatomy and histology--AH; Magnetic Resonance Spectroscopy--diagnostic use--DU